Central Valley Salmonid Satellite Project Work Team:
Juvenile Monitoring
DRAFT Meeting Notes from February 21, 2007
Yolo Bypass Wildlife Area 10:30

Participants: Bill Poytress (Chair; USFWS), Erin Chappell (DWR), Jim Earley (USFWS), Felipe Carrillo (USFWS), Dennis Blakeman (CDFG), Jason Shillam (EBMUD), Richard Corwin (USBR), Robert Vinck (CDFG), Pat Brandes (USFWS), Kellie Whitton (USFWS) and Doug Threloff (USFWS).

I. Introductions and Announcements: Welcome newest participant Jason Shillam (EBMUD) of the Mokelumne River Monitoring Project.

* John Williams' white paper (+500 pages) titled "Central Valley Salmonids" is available through the San Francisco Estuary and Watershed Science online journal. Check the website for this notable work http://repositories.cdlib.org/jmie/sfews/all_issues.html

Pat Brandes (USFWS) had multiple announcements including:
* 2000 Final Annual Progress Report: *Abundance and Survival of Juvenile Chinook Salmon in the Sacramento-San Joaquin Estuary.* Reports available at: http://www.delta.dfg.ca.gov/jfmp/datareports.asp
* 2001-2005 Draft (soon to be final) Monitoring Report is also available
* Draft Report of CWT Data Review (VAMP, Delta Action 8, DCC studies etc) is available for preview or review.
** **VOLUNTEER OPPORTUNITY:** Pat is seeking volunteers interested in assisting with upcoming acoustic tagging work to be done by the Stockton Fish and Wildlife Office. Training on surgical implantation of acoustic tags in juvenile Chinook will take place the last two weeks in April 16-27 at the Mokelumne River Hatchery. Tagging of study fish will occur April 30 – May 2 and May 7-9 at the Merced River Hatchery.

Please contact her for more information at pat_brandes@fws.gov

II. Modify/Adopt agenda – Agenda was altered by removing the Powerpoint presentation offered by Matt Brown and Jim Earley (USFWS) due to unforeseen circumstances. Information regarding their studies are discussed below in the Group Discussion Topic 2.

III. Modify/Adopt draft meeting notes from 11/15/06 - The previous meeting notes were adopted with no further comments.

IV. Group Discussion Topic 1: *Juvenile Monitoring Updates*

P. Brandes (USFWS-STFWO): Juvenile monitoring continues in the Sacramento and San Joaquin Rivers, Delta and San Francisco Bay with beach seines, midwater and kodiak trawls. Additional studies in progress include paired ultra-sonic/CWT Chinook study groups. These fish were released at Sacramento, Ryde and Benicia. The study was initiated in an effort to collaborate with upper Sacramento River ultrasonic studies which began in

the fall of 2006. Pat Brandes' and John Burau's studies will be presented at the 2007 AFS annual meeting in September (symposium #34). Upcoming studies include implanting HTI acoustic tags (see volunteer opportunity above) in Merced fall Chinook smolts (90-105mm) to examine survival from Durham Ferry and Prisoner's Point to Jersey Point and Chipps Island.

J. Shiller (EBMUD): Monitoring is occurring 5 days/week with one 8' rotary trap on the Mokelumne River below WoodBridge Dam. Catch of fall run fry since mid-December has been relatively low (~200 sampled this season). Trap efficiency values derived from intermittent hatchery fry releases are averaging ~10% this season. An acoustic study of 50 hatchery steelhead has been initiated and multiple Vemco receivers have been placed in the Mokelumne river.

R. Vincik (DFG): Knight's Landing is currently sampling two 8' rotary traps and has been conducting mark-recapture experiments with ~5,000 fish / trial. Efficiencies are typically ~ 1.0%. Overall sampling has been relatively slow in terms of captures (all size classes), except for the recent storm event which produced a spike in catch for a short period. Traps are checked daily or every other day depending on abundance and weather activity.

D. Blakeman (DFG): DFG is not currently operating any rotary traps on the Merced, Tuolumne or Stanislaus. Consultants are operating (1) on the lower Merced, (1) on the lower Tuolumne, and (2) on the Stanislaus. Mossdale Kodiak trawl will be conducted by DFG beginning April 1, similar to recent years.

***R. Corwin (USBR-RB)*:** Evaluations of the four research pumps at RBDD are occurring during intermittent pumping operations. Pumps have been operated recently to provide water to users during this unusually dry winter. Recent sample results included fry sized Chinook, January released CNFH steelhead production, and bismark brown marked RBDD RST Chinook fry. Additionally, it is anticipated that the CHO will be operated on Stony Creek due to the dry conditions (hasn't been operated during the last three "wet" years). If operated, fyke net sampling will occur as part of CHO operations.

K. Whitton (USFWS-RBFWO): None of the three Battle Creek 5' rotary traps are currently operating due to lack of funds. One trap located above the CNFH Barrier Weir was operated on a reduced schedule (≈4 days/wk) until 2/15/07. If funding is available, limited sampling is anticipated to occur in March and April when Chinook outmigration is anticipated to increase. Preliminary results from recent sporadic sampling events indicates that we had the highest one day catch of juveniles since January 2000 considering the trap was operated using a modification that samples half of the water volume entering the cone. Sampling on Battle Creek this year is considered to be important as spring Chinook had the highest number of adult returns to the upper watershed in recent years.

J. Earley (USFWS-RBFWO): Two 5' rotary traps are currently operating on Clear Creek. The upper trap is sampling for spring Chinook using a modified (to sample half volume) cone and is anticipated to sample until mid-April. Efficiency estimates are averaging ~12.5% with some variability. Sampling of juveniles has yielded over 12,000 fry thus far.

Rough estimates of the juvenile spring production are ~140,000. Seventy-seven adults were seen during the August snorkel survey. The lower Clear Creek trap is not seeing a lot of fry and is sampling currently with a modified cone. Fall Chinook adult escapement was estimated at 8,422. The lower trap is sampling between 2 % – 7% ($\bar{x}$ = 3.5%), in terms of gear efficiency. Furthermore, some YOY steelhead have been sampled recently.

B. Poytress (USFWS-RBFWO): Rotary trap sampling at RBDD is currently occurring on a week to week basis, pending ratification of a DFG/ERP Directed Action Proposal. The most recent contract and funding ended December 31, 2006 and the operation is currently running on limited bridge funding. Four 8' traps are in operation and sampling has been consistent thus far due to favorable river/sampling conditions. Fry sized fish (fall run) are dominating the catch yet winter sized class fish are being captured on a consistent daily basis with surges of juveniles occurring on the tail end of flow events (fry and older juveniles). Cones are being modified to sample half intermittently in response to surges in abundance. Mark-recapture trials have been occurring in an attempt to get data on fry sized individuals passing during low flow conditions (<7,000 cfs) with and without cones being modified. Efficiency values range from 0.91% (3 modified cones) to 2.17% (4 standard cones). Capture of CNFH late-fall production, steelhead production and LSNFH winter run production has been occurring in recent months. Livebox efficiency studies were being conducted during periods when heavy predation by hatchery steelhead was suspected in January. Steelhead were noted to be milling around the Red Bluff Diversion Dam during February likely due to the fact that no flow events occurred after releases to disperse them more thoroughly (i.e. not the usual pattern of dispersal).

E. Chappell (DWR)*:* Sampling at the south delta pumping facilities indicates that winter Chinook are just starting to show up. Thus far the facilities are well below the 2% take limit allowed for winter Chinook. Additionally, the facilities are well below take limits for the spring-run surrogate releases that occurred this season. Thus far no LSNFH winter Chinook have been seen yet. Pumping is currently low for Delta Smelt for the short term to reduce the likelihood of smelt spawning in the south Delta area.

Colleen Harvey Arrison (DFG) EMAIL UPDATE: "DFG is funded thru IEP to monitor spring-run Chinook and steelhead outmigration on Mill and Deer Creeks. The presence of spring-run outmigrants in either of these creeks is a First Alert Action in the Juvenile Chinook Salmon Protection Decision Process to initiate actions to evaluate and minimize the impact of Water Project operations on spring-run Chinook survival in the Delta. Monitoring will continue as long as this Process has a need to evaluate and provide protection for spring-run Chinook. The data necessary for this protection process is presence/absence of Chinook or Steelhead, size ranges (length frequencies) for each year class, and increases in flow or turbidity.

In addition, bimonthly monitoring in juvenile spring-run Chinook rearing areas using electrofishing and seining, assists in identifying real-time length frequencies of known spring-run Chinook…."

V. Group Discussion Topic 2: *Genetic Sampling of Juvenile Salmonids.*

Current work in progress (info from meeting participants and via email info only) related to sampling of juvenile salmonids is presently occurring on Battle Creek, Clear Creek and the pumping facilities for Chinook and at Knight's Landing for steelhead trout (*O. mykiss).*

The discussion was initiated by having the chair read information emailed to him from Colleen Harvey Arrison (DFG) who was unable to attend but wanted to provide some information. According to the email, "Genetics sampling originally was done in the mid-1990's in spring-run juvenile rearing areas. Sampling terminated due to the inter-relatedness of samples (samples tended to be from siblings when collection method is electrofishing or seining). DFG has a concern about the early genetics work done in the 1990's , such as small sample sizes and lumping of Deer and Mill fish. DFG is waiting for the results of a CALFED funded comprehensive genetic study which was conducted by Carlos Garza. A sample of adult spring-run and fall-run (50/year/run for a 3 year period) was taken from known stocks in both Mill and Deer.''

Erin Chappell presented an update on the Delta Fish Facilities genetics sampling program. In summary, the project was initiated to assess the loss of known winter Chinook versus those that fell into the length-at-date criteria. The project was then expanded to include spring-run Chinook. Genetic identification of winter and spring Chinook is also part of the 2004 OCAP Biological Opinion. Fall and late-fall Chinook are currently lumped together for management purposes. The sampling of juvenile Chinook was initially focused on larger juvenile Chinook with sub-samples taken of smaller fish. Beginning in 2005, 100% sampling was targeted for all Chinook with discretionary sampling of Chinook < 40mm, with sub-sampling occurring when necessary. The initial results of the program indicate that most of the genetic winter-run fall into the winter-run length criteria (using the Delta model). In 2004, most winter run identified by length-at-date were genetically identified as winter with some turning out to be spring-run and some fall/late-fall. In 2005, the majority of the samples failed to amplify and no immediate cause as to why is known. In 2006, a wet year, most categorized winter run were found to be genetically identified as winter run in February and March but again some were identified as spring and fall/late-fall; a few Mill/Deer creek spring-run were also recovered in May and fell in both the spring and fall length criteria. For the period 1996-2002, roughly half of Chinook in the winter length range were genetically determined to be winter-run (12-73%). The program has used the same markers the last 2-3 years with favorable results and individual spring-run identification results are favorable. Moreover, it appears that length-at-date criteria are inaccurate for discriminating between fall and spring run, by overestimating spring-run and underestimating fall-run. Most of the cost of the operation has been for the research and equipment needed to conduct the study. Erin noted that more efficient transportation of samples could reduce time to get results (i.e. no labs in immediate area). Future plans for the program: current contract ends August 2007 and the facilities managers are working on

another 3 year contract with Oregon State University and Dept. of Fish and Game. A report covering the historical data set is anticipated to be out later this year.

Jim Earley spoke of the genetic sampling that has occurred on Clear Creek between 1998 and 2006. Most of the early samples were stored while analysis methods improved and the focus of genetics increased. Thus far, 1,000 samples have been processed by Michael Banks. Preliminary data suggest that both Butte Creek and Mill / Deer Creek type spring-run spawned successfully in Clear Creek. There may also be various spring-spring and spring -fall hybrids in Clear Creek.

In terms of methods, for the 2004-2006 sampling period, the program has been obtaining tissue samples from both the upper and lower traps. Currently they are taking samples in triplicate (1 for study, 1 FWS archive, and 1 for DFG genetic archiving). They typically take an upper caudal fin clip to obtain genetic tissue and often this occurs during the process of dual marking Chinook for mark-recapture studies (i.e. in conjunction with Bismark brown). Sampling of tissue is occurring throughout the temporal distribution by collecting 10 samples per week. Jim's group is currently using ~95% Ethanol to preserve samples as they formerly used Tris buffer which appears to have a shorter shelf life. The questions they are looking to answer relate to the proportion of spring Chinook that occur with fall Chinook in trap samples, and can one trap be used to get spring run *and* fall run production indices. Water temperature appears to have a big effect on spring run emergence; therefore, the Sacramento River length-at-date criteria do not work. Jim stated that the Clear Creek / Battle Creek monitoring program handles collection, processing and archiving of samples. This appears to work better than systems used at the Delta Fish Facilities. He also noted that researchers at Humboldt State University are looking to use genetic analyses techniques on dry scale samples collected over many years from adult spring and fall-run in the Trinity River (Kinzinger et al, in prep).

Future work to be completed was revealed by **Pat Brandes**. She stated that the STFWO has been awarded a 3 year contract derived from the 2006 CALFED Science PSP to allow them to take fin clips of winter Chinook captured at the Chipps Island trawl to be processed (identified using known genetic markers) by Michael Banks of Oregon State University. The contract will allow them to develop a sampling plan in an effort to estimate winter Chinook production passing Chipps Island (i.e. surviving to reach the San Francisco Bay) based on </= 3,000 juvenile fish per year (M. Banks' sample capacity). The plan is to begin sampling in September/October of 2007 and send samples to Michael Banks' lab every 3 to 6 months. It is assumed that winter Chinook pass Chipps Island between September and May of each year and that fish will be sampled during standard monitoring efforts (i.e. no increased/decreased effort planned). Statistical procedures to estimate the annual production passing Chipp's will be developed by Dr. Kenneth Newman, Biostatistician, of the Stockton Fish and Wildlife Office.

VI. Next Meeting Information: *Tentative date rescheduled to THURSDAY May 17, 2007. Please note the original tentatively set date of Wednesday May 16th has been noted as an Adult Escapement PWT meeting date. Please let me know if this conflicts with other meetings.*

VI. Continued.

The next meeting topic is under development and will either be a discussion centered around John Williams' white paper (CV salmonids) with respect to juvenile monitoring **OR** a discussion (initiated by Doug Threlloff (USFWS-CAMP)) to delve into the ability of rotary screw traps to monitor the effectiveness of restoration efforts. Details will be forthcoming, please contact Bill Poytress if you would like to provide input as to the next meeting topic.

References:

Kinzinger, A.P., E.J. Loudenslager, D.G. Hankin, E.C. Anderson, J.C. Garza. In prep. Hybridization between spring-run and fall-run Chinook salmon returning to Trinity River, CA.